

# How do Challenge-hindrances Stressors Differential Influence Employees' Innovative Behavior? The Roles of Job Crafting and Constructive Controversy

Yuying Tang

Guangxi Normal University, China

Xueliang Lai (Corresponding author)

Guilin Institute of Information Technology, China

E-mail: 89550946@qq.com

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## Abstract

This study investigates the complex relationship between challenge-hindrances stressors and employees' innovative behavior by examining job crafting as a mediating variable and constructive controversy as a moderating variable. To test our theoretical model, we utilized multilevel sampling method to collected data from a sample of 560 employees of high-tech enterprises in eastern China, and performed confirmatory factor analysis using AMOS 24, conducted reliability tests and hierarchical regression analysis via SPSS 26, and examined the mediating and moderating effects through the Bootstrap sampling approach. Our findings indicate that challenge stressor have a positive influence on both job crafting and employees' innovative behavior. Conversely, hindrance stressor has a significant negative correlation with job crafting and employees' innovative behavior. Notably, job crafting serves as a mediating factor in the relationship between challenge-hindrances stressors and employees' innovative behavior. Furthermore, constructive controversy amplifies the positive impact of challenge stressors on job crafting, it positively moderates the mediating influence of job crafting on the relationship between challenge stressors and employees' innovative behavior.

**Keywords:** Stressors, Job crafting, Controversy, Innovative, High-tech enterprises

## 1. Introduction

Currently, innovation plays a key role in driving the economic growth of various countries.

The competition between enterprises is no longer limited to product quality and enterprise strength; having stronger innovative ability is more critical (Bai, 2022). Employees are the key participants in enterprise innovation. They continually generate new ideas and methods, and maximizing their innovation has become crucial to enterprise development. Enterprises have established higher innovation targets for employees, which has exerted considerable pressure on employees (Wang et al., 2022). This has been receiving increasing attention. According to Lepping et al. (2016), work stress exceeded the scope of an individual's capabilities or resources and was a hindrance for the individual. However, Cavanaugh et al. (2000) found that a type of stress arises from challenging work demands, such as work load and complexity. Another type of stress is unrelated to job content, such as organizational politics, ambiguous roles, and work autonomy. In 2020, he proposed the concept of challenge-hindrance stressors. Challenge stressors refer to a category of stress associated with challenging work demands. This type of stress is primarily linked to work requirements or the work environment, with typical examples including workload, time pressure, task complexity, and work responsibilities. Hindrance stressors are defined as a form of stress that impedes the development of an individual's capabilities and thwarts the realization of their personal value. Challenge stressors can induce stress, but they can also have positive effects, such as fostering employee growth, improving earnings, and enhancing achievement (Kochenour, 2020). Hindrance stressors impede individual development and value realization (Cavanaugh et al., 2000), and this leads to negative emotions such as fear and frustration (French et al., 2019).

This study focuses on innovation at the individual level, delving deep into the relationship between challenge-hindrance stressors and employees' innovative behavior, which is crucial for enterprises to effectively implement stress management and enhance competitiveness.

Scholars have increasingly conducted in-depth research on challenge-hindrance stressors and gained a systematic understanding of stress connotations and dimensions. They have also emphasized the importance of distinguishing between stressors and explored how challenge-hindrance stressors affect individual emotions, work behavior, innovation, and performance differently (Du et al., 2023; Farrukh et al., 2022; Lu et al., 2016; Min et al., 2015b; Xu & Wang, 2020). In recent years, the research perspective has expanded to the interaction between individuals and situations. Liu et al. (2022) and Shang et al. (2023) found that social support and organizational identification can reduce employees' perceived stress.

Scott and Bruce (1994) believes that innovative behavior refers to the actions taken by employees to generate innovative ideas or solutions to problems and then implement them. This behavior is crucial for maintaining organizational competitiveness and improving performance (Montani et al., 2017). The academic research on employees' innovative behavior mainly focuses on their antecedent variables (Wang et al., 2022). The research focus has gradually shifted from personal characteristics such as individual motivation (Zhao et al., 2011), personal traits (Chao et al., 2011), and self-efficacy (Rohr et al., 2014) to organizational characteristics such as organizational atmosphere (Kang et al., 2016), organizational support (Guo & Zhu, 2022), and leadership style (Zhang & Wang, 2022).

Currently, some scholars have paid attention to the relationship between challenge-hindrances stressors and employees' innovative behavior. Meng et al (2023) believed that challenge stressors promote employees' innovative behavior through psychological distance, while hindrance stressors inhibit it. Fan et al. (2022) found that hindrance stressors have significant negative impact on employees' innovative behavior, and proactive personality and employment relationship atmosphere can alleviate this negative impact to a certain extent. However, studies overlook the spontaneous reconfiguration of work content, style, and relationships, as well as the effects of healthy debates between employees on various kinds of information, theories, and perspectives.

In 2001, Wrzesniewski and Dutton (2001) introduced the concept of job crafting, which refers to employees taking the initiative to redefine and shape their work tasks, methods, and relationships (Wrzesniewski & Dutton, 2001). Unlike traditional top-down work arrangements, job crafting is a bottom-up process, passive management approach and offers employees more work resources and new working perspectives (Wrzesniewski et al., 2010). When employees face challenge-hindrances stressors, they are more likely to exhibit innovative behavior through job crafting (Yu et al., 2023).

Constructive controversy involves debate between individuals regarding different ideas, facts, theories, and opinions (Chen et al., 2011). This can lead to an open discussion based on trust and ultimately arrive at clear conclusions (Alper et al., 1998). Ou et al. (2018) think the conflict of different viewpoints and ideas is a crucial prerequisite for creativity. In various stressful situations, job crafting and innovative behavior are influenced differently, leading to varied outcomes (Yu et al., 2023).

Therefore, this study constructs a theoretical framework for the relationship between challenge-hindrances stressors and employees' innovative behavior, exploring the mechanism of job crafting and constructive controversy.

## 2. Literature Review and Hypotheses

### *2.1 Challenge-hindrances Stressors and Employees' Innovative Behavior*

According to the conservation of resources model, individuals consider resources valuable and work to acquire and maintain them. Consequently, individuals view challenge stressors as critical for achieving their personal goals (Hobfoll, 1989). When faced with them, employees tend to adopt positive coping strategies, invest more time and energy, and promote innovative ideas and behaviors (Podsakoff et al., 2007). Under stressful situations, employees are more likely to explore various solutions and find innovative ways to deal with difficulties and challenges (Moin et al., 2023). Challenge stressors can motivate employees to step out of their comfort zone, calling upon their inner motivation and driving them to creatively solve problems through innovative thinking (Yu et al., 2023).

However, Lu et al (2016) believe that the negative emotions attributable to hindrance stressors can exhaust employees' emotional resources, weaken their innovation ability and motivation. Wang et al. (2022) find that employees may lack the knowledge and skills to solve problems and may perceive this as a hindrance to personal growth and ability. When

facing hindrance stressors, they are more likely to avoid risks and behave conservatively, rather than try new innovative methods and ideas (Yu et al., 2023). According to the theory of resource conservation, when individuals face a pressure that consumes a lot of energy and time without yielding effective returns, they may consider avoiding it or giving up (Pearsall et al., 2009). This could lead to the lack of proactive initiative in dealing with such pressure and may even result in negative attitudes toward problem-solving, reducing innovative behavior (Hobfoll et al., 2018).

Therefore, this study proposes the following hypotheses:

H1a: Challenge stressors are positively correlated with employees' innovation behavior.

H1b: Hindrance stressors are negatively correlated with employees' innovation behavior.

## *2.2 Mediating Role of Job Crafting*

When employees encounter challenging work requirements set by the organization or managers, they realize their autonomy in their work through cognitive evaluation, and this enables them to engage in job crafting by improving work methods, altering job content, and expanding job scope, to successfully complete the task and receive rewards (Liu & Ren, 2022; Tims & Bakker, 2010). Harju et al (2016) demonstrated that employees are inclined to strengthen communicative interactions with both leaders and colleagues, proactively pursue feedback and support, and take initiative in optimizing workplace interpersonal relationships by means of relationship-building practices. Tims and Bakker believe that job crafting helps employees gather work-related information and expand their work resources, enabling them to perform more effectively. When individuals actively face challenge stressors and accomplish challenging work, they experience a sense of work value and achievement, which promotes cognitive job crafting, altering their perception of work. Thus, individuals become more actively involved in their work and deal with stress in a more positive and healthier manner (Slemp et al., 2021).

Wrzesniewski et al (2010) believe through job crafting, employees seek feedback and support from the organization from the bottom up, allowing them to create or access resources that enhance their work efficiency. This process also grants them greater autonomy and decision-making power, enabling them to choose working methods that suit them best. Li et al (2021) find the increase in work resources can stimulate employees' intrinsic motivation, fostering creative thinking to solve problems. Furthermore, job crafting improves interpersonal relationships and increases interpersonal resources, creating a more comfortable working environment and fostering high-quality social relations (Tims & Bakker, 2010). By interacting with different colleagues, employees can gain diverse information, thereby enhancing their creativity level (Mueller & Kamdar, 2011). Cognitive reshaping deepens employees' understanding of the meaning of work and enhances their identification with work. This fosters a positive working attitude, leading employees to dedicate themselves to their work, exhibit greater creativity, and engage in innovative behavior (Bindl et al., 2019).

Hindrance stressors, such as organizational politics and ambiguous roles, present significant obstacles to employees and are challenging to resolve (Cavanaugh et al., 2000). Chen et al

(2021) believe through cognitive evaluation, employees perceive that such work may cause psychological and physical harm, making it difficult for them to gain rewards; this may lead to risk aversion and a conservative mindset. They then tend to maintain the status quo, reduce their time and energy inputs, and are unwilling to try to reshape their work. They may also respond negatively to job requirements, reduce their work commitment, and refuse to take on additional tasks owing to uncertainty and tension. Employees may no longer try to find new ways to solve problems and thus lack the internal motivation to generate innovative ideas, inhibiting the occurrence of innovative behavior (Min et al., 2015).

Therefore, this study proposes the following hypotheses:

H2a: Job crafting plays a mediating role between challenge stressors and employees' innovative behavior.

H2b: Job crafting plays a mediating role between hindrance stressors and employees' innovative behavior.

### *2.3 Moderating Role of Constructive Controversy*

Constructive controversy, as a form of horizontal interaction between employees, prompts employees to deeply consider diverse viewpoints and encourages them to adopt an open-minded approach to cognitive doubts (Johnson & Johnson, 2009). It can help employees learn from others' experiences, contemplate how to enhance their own working methods and content, and reassess their working status and environment (Bird & Erickson, 2010). When individuals actively confront challenge stressors and overcome the pressure to complete challenging work, they gain a sense of work value and achievement, and this can lead to increased engagement in work and a more positive and healthier approach to managing pressure (Lin & Ling, 2018). The conflict of differing viewpoints provides a fresh perspective for employees' work, expands their cognitive boundaries, and increases their cognitive resources (Ou et al., 2018). When employees face challenging work requirements set by the organization or managers, constructive controversy helps them gain more resources to improve working methods, change job content and scope, and engage in job crafting (Wei et al., 2023). Through constructive controversy, employees can enhance their communication with leaders and colleagues, broaden their interpersonal communication, and rebuild relationships (Bhatnagar & Tjosvold, 2012). Collision with colleagues' viewpoints also helps employees better understand their own job content, leading to more active participation in work, a more positive and healthier attitude in coping with stress, and cognitive job crafting (Chen et al., 2011; Tims et al., 2013). Tims and Bakker (2010) find job crafting brings about changes in employees' interpersonal relationships and increases their interpersonal resources. Harju et al (2016) believes job crafting makes it easier for employees to gather work information and expand work resources in new work situations and perspectives as well as build high-quality social relationships. This also provides them opportunities to identify new problems, face more challenges and growth opportunities, proactively seek solutions, and exhibit greater creativity. Tim et al. (2016) also find that when employees face hindrance stressors such as organizational politics, ambiguous roles, and work autonomy, positive and constructive communication and debate can help them relieve pressure, improve emotions,

better handle difficulties and challenges, and reduce the psychological and physiological damage attributable to hindrance stressors. Thus, constructive controversy can reduce the negative impact of hindrance stressors on job crafting and help employees innovate.

H3a: Constructive controversy positively moderates the relationship between challenge stressors and job crafting.

H3b: Constructive controversy negatively moderates the relationship between hindrance stressors and job crafting.

H4a: When the constructive controversy is higher, the mediating effect of job crafting between challenge stressor and employees' innovative behavior is stronger.

H4b: When the constructive controversy is higher, the mediating effect of job crafting between negative stressor and employees' innovative behavior is weaker.

Figure 1 illustrates the research framework for challenge-hindrance stressors, job crafting, constructive controversy, and employees' innovative behavior.

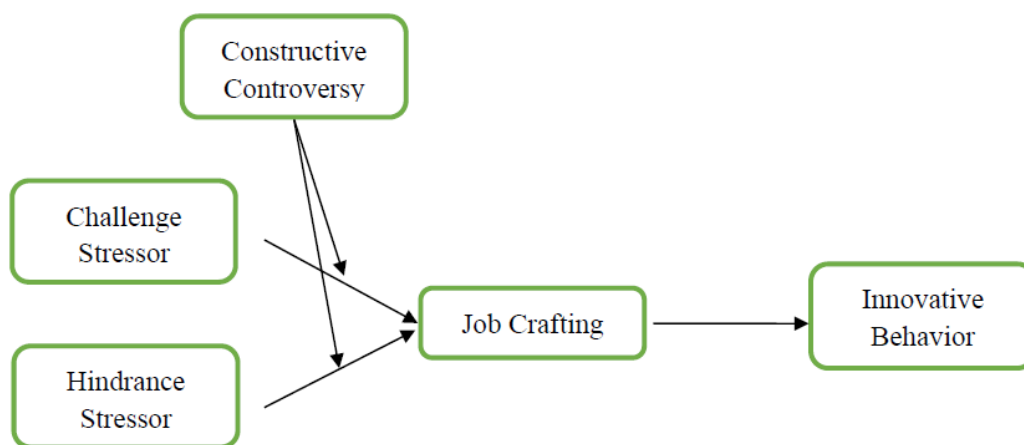


Figure 1. Research framework

### 3. Method

#### 3.1 Measures

The current study aims to explore the relationship between challenge-hindrance stressors, job crafting and constructive controversy, and how they directly and indirectly impact employees' innovative behavior. This research is conducted using a quantitative approach. A Likert scale was used to assess the variables in the questionnaire.

We used the scale originally developed by Cavanaugh in 2000 to measure challenge-hindrance stressors, which has two-dimensional. The CS dimension consists of six questions, regarding topics such as "The number of projects and or assignments I have." The HS dimension comprises five questions, regarding topics such as "The degree to which politics rather than performance affects organizational decisions." This scale has good

reliability and validity.

We used the scale originally developed by Slemp et al. (2013) to measure job crafting (JC), which has three dimensions: task crafting (TC; five questions), cognitive crafting (CCR; five questions), and relational crafting (RC; five questions) (Slemp & Vella-Brodrick, 2013). Example of tasks include “Introduce new approaches to improve your work,” “Think about how your job gives your life purpose,” and “Make an effort to get to know people well at work.” This scale demonstrates good reliability and validity.

We used the scale originally developed by Tjosvold in 1998 to measure constructive controversy (CC) (Tjosvold, 1998), which includes one dimension and eight measurement items, such as “Team members express their own views directly to each other.” This scale too has good reliability and validity.

Additionally, we used the scale originally developed by Zhang et al. (2016) to measure innovative behavior (IB) (Zhou et al., 2023), which consists of one dimension and eight questions, such as “I am always looking for opportunities to improve my work methods and processes.” This scale also has good reliability and validity.

### *3.2 Data and Sample*

This study considers the employees of high-tech enterprises in eastern China (Hainan, Guangdong, Fujian, Shanghai, Zhejiang, Jiangsu, Shandong, Hebei, Tianjin, and Beijing).

To ensure employees across diverse company levels and types are adequately represented in the sample, this study employs a stratified random sampling method for data collection. This approach enhances the sample’s ability to mirror the characteristics of the target population, minimizes sampling bias, and thereby strengthens the generalization and persuasiveness of the research findings. The questionnaire was issued from Sep. 5, 2023 to Oct. 28, 2023. Based on industry classification, high-tech enterprises were divided into seven categories: electronic information technology, biological and medical technology, aerospace technology, new material technology, new energy and energy-saving technology, resources and environmental technology, and high-tech service industry. For each industry, we randomly selected eight enterprises, and for each enterprise, we issued 10 questionnaires. With the help of human resource management personnel, we distributed 560 questionnaires, of which 498 were recovered, with a recovery rate of 88.93%. To ensure data quality, we removed 11 questionnaires with abnormally short filling time, 19 questionnaires with similar answers and missing items, and 8 questionnaires with obviously contradictory options. After screening, 460 valid questionnaires were finally used for the study.

Of the research participants, 228 were male (49.6%) and 232 female (50.4%), indicating a balanced proportion. In terms of age, 80 employees were under 25 years (17.4%), 229 were 26–35 years (49.8%), 126 were 36–45 years (27.4%), and 25 were 46 years and above (5.4%), indicating that the majority of the participants were 35 years or below. In terms of education, 99.6% of the surveyed employees had a bachelor’s degree or higher. Most employees had worked in their current company for 2–10 years (78.4%). In terms of the nature of the enterprise, 32 participants were from state-owned enterprises (7%), 277 were from private

enterprises (60.2%), 125 were from foreign-owned/joint ventures (27.2%), and 26 were from other types of enterprises (5.7%). In terms of breakdown by position, the largest group comprised general employees, with 207 participants (45%), followed by 121 grassroots managers (26.3%), and 132 middle and senior managers (28.7%). For specific data, see Table 1.

Table 1. Demographic characteristics

Characteristics	Category	Frequency	Percentage
<b>Gender</b>	Female	232	50.4
	Male	228	49.6
<b>Age (years)</b>	25 and below	80	17.4
	26–35	229	49.8
	36–45	126	27.4
	46 and more	25	5.4
<b>Education</b>	Specialist or under	2	0.4
	Bachelor's	310	67.4
	Master's	122	26.5
	Doctor	26	5.7
<b>Years of working</b>	1 or less	67	14.6
	2–5	180	39.1
	6–10	181	39.3
	11 or more	32	7.0
<b>Unit category</b>	State-owned enterprises	32	7.0
	Private enterprises	277	60.2
	Foreign/joint ventures	125	27.2
	Others	26	5.7
<b>Position level</b>	General staff	207	45.0
	Grassroots management	121	26.3
	Middle management	100	21.7
	Senior management	32	7.0

## 4. Empirical Analysis

### 4.1 Reliability and Validity Analysis

We used SPSS 26 and AMOS 24 software to assess the reliability and validity of the scales. The KMO values for all scales exceeded 0,8, (0.8) indicating strong correlation between the scale items, which is essential for factor analysis. The standardized factor load coefficients were all greater than 0.5, the average variance extracted (AVE) ranged from 0.470 to 0.772, and composite reliability (CR) ranged from 0.811 to 0.973. These three indices satisfied the requirements of convergence validity (Everitt & Dunn, 2001; Fornell & Larcker, 1981). The Cronbach's  $\alpha$  of HS was 0.799; for all the other variables, it was greater than 0.9, indicating high internal consistency (Thorpe, 2021). See Table 2.



Table 2. Reliability and validity test results

Variable	Item Code	Factor Loadings			Cronbach $\alpha$	AVE	CR	KMO
CS	CS1	0.882			0.928	0.736	0.943	0.929
	CS2	0.854						
	CS3	0.838						
	CS4	0.846						
	CS5	0.858						
	CS6	0.868						
HS	HS1	0.691			0.799	0.556	0.862	0.816
	HS2	0.787						
	HS3	0.702						
	HS4	0.752						
	HS5	0.789						
JC	TC1		0.826		0.927	0.509	0.836	0.927
	TC2		0.821					
	TC3		0.622					
	TC4		0.688					
	TC5		0.575					
	CCR1			0.671		0.470	0.811	
	CCR2			0.835				
	CCR3			0.775				
	CCR4			0.505				
	CCR5			0.590				
	RC1	0.716				0.542	0.855	
	RC2	0.731						
	RC3	0.736						
	RC4	0.741						
	RC5	0.757						
CC	CC1	0.893			0.959	0.772	0.973	0.962
	CC2	0.878						
	CC3	0.888						
	CC4	0.862						
	CC5	0.866						
	CC6	0.871						
	CC7	0.892						
	CC8	0.885						
IB	IB1	0.804			0.919	0.638	0.934	0.937
	IB2	0.782						
	IB3	0.773						
	IB4	0.765						
	IB5	0.803						
	IB6	0.783						
	IB7	0.828						
	IB8	0.848						

Table 3 indicates that the five-factor model had the best fit among several models, with each variable demonstrating good discriminative validity. Additionally, the fit indices of the five-factor model (RMSEA = 0.044, IFI = 0.937, CFI = 0.936, TFI = 0.930,  $\chi^2/df = 2.607$ ) met the requirements and were all significant at the  $p < 0.01$  level. These results indicated good structural validity of the study.

Table 3. Model fitting table (N=460)

Model	$\chi^2$	df	$\chi^2/df$	RMR	CFI	IFI	RMSEA	TLI
<b>Five-factor</b>	1029.653	395	2.607	.044	.936	.937	.059	.930
<b>Four-factor</b>	1572.056	399	3.940	.052	.882	.883	.080	.872
<b>Three-factor</b>	2461.914	402	6.124	.140	.794	.794	.106	.777
<b>Two-factor</b>	3568.994	404	8.834	.103	.683	.684	.131	.658
<b>Single factor</b>	4037.326	405	9.969	.103	.636	.637	.140	.609

Single factormodel: CS+HS+JC+CC+IB; Two-factormodel: CS+HS+JC+CC, IB; Three-factormodel: CS+HS, JC+CC, IB ; Four-factor model: CS+HS, JC, CC, IB ; Five-factormodel: CS, HS, JC, CC, IB.

#### 4.2 Common Method Variance Test

When common method factor was added to the five-factor model and then the model compared with the five-factor model, the RMR, RMSEA, CFI, and IFI indices did not change, but the TLI index decreased by 0.01. Therefore, there was no common methodological bias in the study, as shown in Table 4.

Table 4. Common methodological bias tests

Model	$\chi^2$	df	$\chi^2/df$	RMR	CFI	IFI	RMSEA	TLI
<b>Five-factor</b>	797.457	395	2.019	.039	.959	.959	.047	.955
<b>Add common method factor</b>	797.452	393	2.029	.039	.959	.959	.047	.954

#### 4.3 Data Descriptive Statistics

The mean and standard deviation in this study fell within the normal range. The standard error ranged from 0.030 to 0.045, indicating little difference between the sample mean and population mean. Therefore, the sample data were representative of the population data.

Table 5. Data descriptive statistics

Variable	Mean	SD	SE
<b>CS</b>	3.394	0.791	0.037
<b>HS</b>	2.762	0.653	0.030
<b>TC</b>	3.781	0.714	0.033
<b>CCR</b>	3.690	0.734	0.034
<b>RC</b>	3.687	0.757	0.036
<b>JC</b>	3.719	0.648	0.030
<b>CC</b>	3.564	0.971	0.045
<b>IB</b>	3.397	0.783	0.034

#### 4.4 Hypothesis Testing

##### 4.4.1 Challenge-hindrane Stressors and Employees' Innovative Behavior

In Model 1, the control variables indicated that employees' innovative behavior was

significantly influenced by unit category and position level. In Models 2 and 3, employees' innovative behavior was significantly affected by challenge stressors ( $\beta = 0.502$ ,  $p < 0.01$ ) and significantly negatively affected by hindrance stressors ( $\beta = -0.546$ ,  $p < 0.01$ ). Therefore, H1a and H1b were supported (Table 6).

Hence, when employees face meaningful challenges, it stimulates innovative behavior by prompting them to think creatively and seek new solutions (Min et al., 2015a). However, when faced with hindrance stressors, employees may perceive difficulties as insurmountable, leading to decreased ability and motivation to innovate. This negative perception may also cause them to adopt a negative attitude toward problem-solving, further reducing their innovative behavior (Yu et al., 2023).

Table 6. Multiple regression analyses results

Variables	Employees' innovative behavior					Job crafting			
	M1	M2	M3	M4	M5	M6	M7	M8	M9
Gender	0.018	0.006	0.053	0.029	0.085	-0.079	-0.082	-0.063	-0.063
Age	-0.097	-0.069	-0.102	-0.071	-0.125	-0.034	-0.032	-0.051	-0.051
Degree of education	0.000	-0.044	-0.014	-0.032	0.032	-0.036	-0.032	-0.007	-0.007
Years of working	-0.039	-0.009	0.034	-0.001	0.017	0.000	0.004	-0.009	-0.010
Unit category	-0.139***	-0.062	-0.055	-0.061	-0.115***	0.006	0.004	-0.034	-0.033
Position level	0.302***	0.201***	0.107***	0.172***	0.161***	0.109*	0.100	0.140*	0.141*
CS		0.502***		0.447***		0.276***	0.280***		
HS			-0.546***		-0.538***			-0.134**	-0.134**
JC				0.227***	0.223***				
CC						0.410***	0.436***	0.361***	0.360***
CS*CC							0.087*		
HS*CC									0.008
F	6.619***	30.009***	85.553***	32.350***	47.001***	18.707***	17.205***	13.623***	12.087***
R <sup>2</sup>	0.081	0.317	0.603	0.365	0.455	0.249	0.256	0.195	0.195
Adj-R <sup>2</sup>	0.068	0.307	0.596	0.353	0.445	0.236	0.241	0.180	0.179

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

#### 4.4.2 Mediating Effect of Job Crafting

Following the procedure of existing studies, this study tested the mediating effect using hierarchical regression (Baron & Kenny, 1986) and Bootstrap sampling (Efron, 1992) methods.

In Table 6, and according to Model 2, employees' innovative behavior was significantly affected by challenge stressors. Building on Model 2, job crafting was added to create Model 4. In Model 4, employees' innovative behavior was significantly influenced by job crafting ( $\beta = 0.227$ ,  $p < 0.01$ ), indicating a significant mediating effect, thus supporting H2a. In Model 4, after adding the mediator variable job crafting, the coefficient of innovative behavior affected by challenge stressors decreased, suggesting that job crafting partially mediated this relationship. Similarly, according to Model 3, employees' innovative behavior was significantly negatively affected by hindrance stressors. Furthermore, when job crafting was added to construct Model 5, employees' innovative behavior was significantly affected by job crafting ( $\beta = 0.223$ ,  $p < 0.01$ ), supporting H2b. The coefficient of hindrance stressors' effect on employees' innovative behavior decreased, indicating that job crafting plays a partial

mediating role.

Therefore, challenging pressure can stimulate employees’ internal motivation and drive them to proactively reshape their work to better cope with external challenges(Xu & Wang, 2020). This behavior of reinvention can help promote employees’ innovative behavior (Luoh et al., 2014; Tims & Bakker, 2010). Conversely, obstructive stress can act as a barrier to employees, leading to a tendency to maintain the status quo, lack of willingness to change work, and reluctance to try to find new solutions; this ultimately inhibits innovative behavior(Liu et al., 2022; X. Wang et al., 2022).

#### 4.4.3 Moderating Effect of Constructive Controversy

As depicted in Table 6, challenge stressors and constructive controversy were added to Model 1 to build Model 6, and this increased the explanatory effect on job crafting ( $\Delta R$  square = 0.219). Then, the interaction terms of challenge stressors and constructive controversy were added to build Model 7, revealing a significant moderating effect ( $\beta = 0.087, p < 0.05$ ), and thereby supporting H3a. Next, hindrance stressors and constructive controversy were added to Model 1 to obtain Model 8. The interaction terms of hindrance stressors and constructive controversy were added to build Model 9. According to the test results, the interaction terms of hindrance stressors and constructive controversy did not significantly moderate job crafting ( $\beta = 0.008, p > 0.05$ ), and so H3b was not supported. As H4b was based on H3b, H4b also was not supported, and hence we did not further verify H4b in this paper.

To further examine the direction of the moderating effect, we added or subtract one standard deviation from the mean of the moderator variable and divided the moderator variable into high and low levels respectively. The slope of constructive controversy was slightly larger at high levels, indicating that the higher the level of constructive controversy, the more significant the effect of challenge stressors on job crafting (Figure 2).

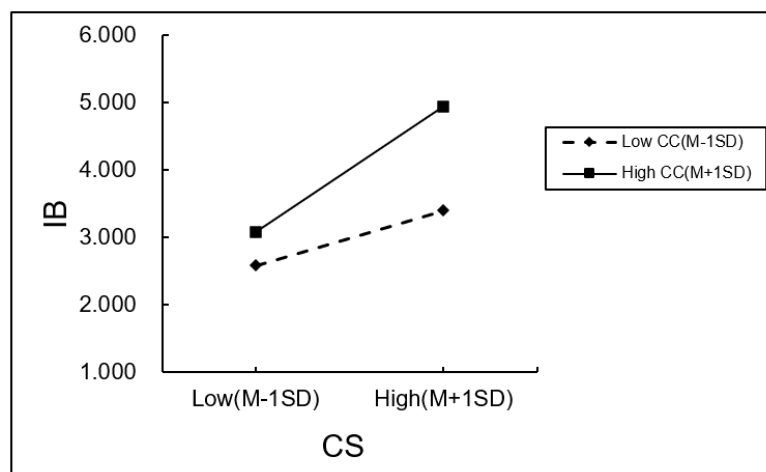


Figure 2. Moderating effect of constructive controversy

In the model where challenge stressors affect employees’ innovative behavior through job

crafting under the condition of high constructive controversy, the confidence interval was [0.0498, 0.1383], excluding 0, with an indirect effect of 0.0894. The moderated mediating effect was significant. Under low constructive controversy, the confidence interval was [0.0119, 0.0848], excluding 0, with an indirect effect of 0.0429. The moderated mediating effect was again significant. Compared with low-level constructive controversy, when there is high-level constructive controversy, job crafting played a stronger mediating role in the relationship between challenge stressors and employees' innovative behavior. Thus, H4a was supported, as shown in Table 7.

Table 7. Results of moderated mediating effect tests

	Effect	BootSE	Bootstrap 95% confidence interval	
			BootLLCI	BootULCI
Moderated mediation model	0.0239	0.0111	0.0024	0.0459
Low CC (mean -1 standard deviation)	0.0429	0.0185	0.0119	0.0848
High CC (mean +1 standard deviation)	0.0894	0.0226	0.0498	0.1383

Therefore, when employees face challenging work requirements arranged by the organization or managers, constructive controversy helps them acquire more resources and information (Chen et al., 2011), and this in turn enables them to improve their work methods, alter the content and scope of their work, and engage in work reshaping (Bakker et al., 2012). Thus, employees have the opportunity to identify new problems and demonstrate greater creativity (Harju et al., 2016). However, when faced with hindrance stressors, although debate and communication can alleviate stress, they are not effective in mitigating the negative effects of organizational politics, role ambiguity, and other factors (O'Brien & Beehr, 2019). Employees will still lack the motivation to change their work and are reluctant to invest in finding new solutions, ultimately inhibiting innovative behavior (Wisse et al., 2015). Therefore, constructive controversy alone is not enough to overcome the barriers to work formulation and innovative behavior (Chen et al., 2011).

## 5. Results

This study found that employees' innovative behavior is positively affected by challenge stressors and negatively affected by hindrance stressors. Furthermore, challenge-hindrance stressors influence employees' innovative behavior through job crafting. Under challenge stressors, constructive controversy promotes job crafting and employees' innovative behavior, enhancing the mediating role of job crafting. However, constructive controversy does not play a moderating role in hindrance stressor situations. The results are presented in Table 8.

Table 8. Results of hypothesis test

	<b>Hypothetical</b>	<b>Results</b>
<b>H1a</b>	Challenge stressors are positively correlated with employees' innovation behavior.	Support
<b>H1b</b>	Hindrance stressors are negatively correlated with employees' innovation behavior.	Support
<b>H2a</b>	Job crafting plays a mediating role between challenge stressors and employees' innovative behavior.	Support
<b>H2b</b>	Job crafting plays a mediating role between hindrance stressors and employees' innovative behavior.	Support
<b>H3a</b>	Constructive controversy positively moderates the relationship between challenge stressors and job crafting.	Support
<b>H3b</b>	Constructive controversy negatively moderates the relationship between hindrance stressors and job crafting.	No
<b>H4a</b>	When the constructive controversy is higher, the mediating effect of job crafting between challenge stressor and employees' innovative behavior is stronger.	Support
<b>H4b</b>	When the constructive controversy is higher, the mediating effect of job crafting between negative stressor and employees' innovative behavior is weaker.	No

## 6. Research Contribution

### 6.1 Theoretical Contribution

This study examined the influence mechanism of challenge-hindrance stressors on employees' innovative behavior, with job crafting as the mediating variable and constructive controversy as the moderating variable. This approach is helpful to further understand the influence of different types of stress on employees' innovative behavior. This study thus supplements the literature by providing a new theoretical framework for research in the field of organizational behavior.

### 6.2 Management Practice Contribution

The results of this study can serve as valuable reference for enterprise managers, helping them design and implement effective management measures. Thus, managers can improve employees' innovative ability and work performance by promoting job crafting and constructive controversy, optimizing the working environment, minimizing the impact of adverse factors on employees' innovation, and improving organizational innovative ability and competitiveness.

## 7. Recommendations

### 7.1 Use Challenge Stressors Effectively

Employees should be assigned challenging tasks and provided with training and learning opportunities to help them continuously improve their ability to cope with and overcome challenges (Azeem et al., 2023); Furthermore, employees' efforts and achievements should be recognized and rewarded in a timely manner to motivate them to continue contributing to the success of the organization.

### 7.2 Encourage Debate between different Viewpoints

Managers should break the traditional organizational hierarchy, change the management

approach, and provide space and an environment for the free exchange of ideas among employees (Wei et al., 2023). They should properly design, initiate, and lead constructive controversy by promoting open communication and discussion, encouraging employees to share innovative ideas and experiences, and providing timely feedback and recognition. Through effective communication and cooperation, managers will be able to better leverage constructive controversy, promote innovation, and enhance the enthusiasm and motivation of employees for innovation.

## **8. Limitations and Future Research**

1. This study analyzes challenge-hindrance stressors, job crafting, constructive controversy, and employees' innovative behavior mainly at the individual level, and not at the team level. Future studies should use a cross-level model to further explore and improve the theoretical system of challenge-hindrance stressors and employees' innovative behavior.

2. This study examines employees' innovative behavior without differentiating between active and passive innovative behavior. The involuntary innovative behaviors of employees who are under internal and external stress to complete innovation indicators or tasks represent passive innovative behaviors (赵斌 et al., 2015). Future studies can start from specific situations to enrich and refine the theoretical system of individual innovative behavior.

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## **Authors contributions**

Dr. Yuying Tang were responsible for study design, data collection. Xueliang Lai drafted the manuscript and revised it. All authors read and approved the final manuscript. Authors contributed equally to the study.

## **Competing interests**

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## **Informed consent**

Obtained.

## **Provenance and peer review**

Not commissioned; externally double-blind peer reviewed.

## **Data availability statement**

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

### Data sharing statement

No additional data are available.

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